VA/DOD CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF ISCHEMIC HEART DISEASE MODULE G SUMMARY

MEDICAL FOLLOW-UP AND SECONDARY PREVENTION

Patients who have a history of ischemic heart disease (IHD) are candidates for secondary prevention of further coronary events. These include patients with prior myocardial infarction (MI), ischemic cardiomyopathy, silent ischemia, segmental wall motion abnormality by left ventricular (LV) angiography or cardiac ultrasound, positive stress test, prior coronary revascularization, pathologic Q-waves on the resting electrocardiogram (ECG), and males older than age 50 with typical angina.

This module provides guidelines for clinical predictors for progression of IHD and identifies areas for which there are effective interventions. It also emphasizes that all patients are on optimal doses of pharmacological therapies with proven morbidity and mortality benefits, and that patients are assessed for possible benefits from a revascularization procedure.

This module also emphasizes the assessment for coronary artery disease (CAD) risk factors, where interventions are known to reduce the likelihood of future coronary events (particularly smoking, diabetes mellitus [DM], dyslipidemia, and hypertension). Although the evidence of benefit is less strong, the diagnosis and treatment of depression and promotion of cardiac rehabilitation are also discussed.

KEY ELEMENTS

Management of Medical Follow-Up

- Identify and triage IHD patients with a possible acute coronary syndrome (i.e., ST-elevation myocardial infarction (STEMI), non-ST-elevation myocardial infarction (NSTEMI), or unstable angina).
- Assess if stable symptoms are due to noncardiac conditions.
- Identify and treat other medial conditions that may exacerbate IHD symptoms.
- Ensure all patients receive aspirin (or other antiplatelet therapy, as appropriate).
- Titrate pharmacological therapy for ischemia, angina, and congestive heart failure (CHF) to physiologic end-points, therapeutic doses, or patient tolerance.
- Administer a cardiac stress test to assess the risk of future cardiac events, if not previously performed, or if there has been worsening of ischemic symptoms.
- Initiate angiotension-converting-enzyme (ACE) inhibitor therapy for patients with significant DM and/or left ventricular (LV) dysfunction (ejection fraction [EF] <0.40). Consider in patients without LV dysfunction.
- Identify and provide therapy for patients with heart failure.
- Identify patients at high risk for sudden cardiac death or complications for whom a cardiology referral is appropriate.

Secondary Prevention

- Assure appropriate treatment with beta-adrenergic blocking agents (beta-blockers) in patients with prior MI.
- Identify and treat patients with high low-density-lipoprotein cholesterol (LDL-C).
- Assess and treat high blood pressure.
- Reduce cardiac risk with smoking cessation.
- Promote cardiac rehabilitation as secondary prevention.
- Achieve tight glycemic control in diabetics.
- Screen for depression and initiate therapy or refer.
- Provide patient education and arrange follow-up.

VA access to full guideline: http://www.oqp.med.va.gov/cpg/cpg.htm
DoD access to full guideline: http://www.QMO.amedd.army.mil

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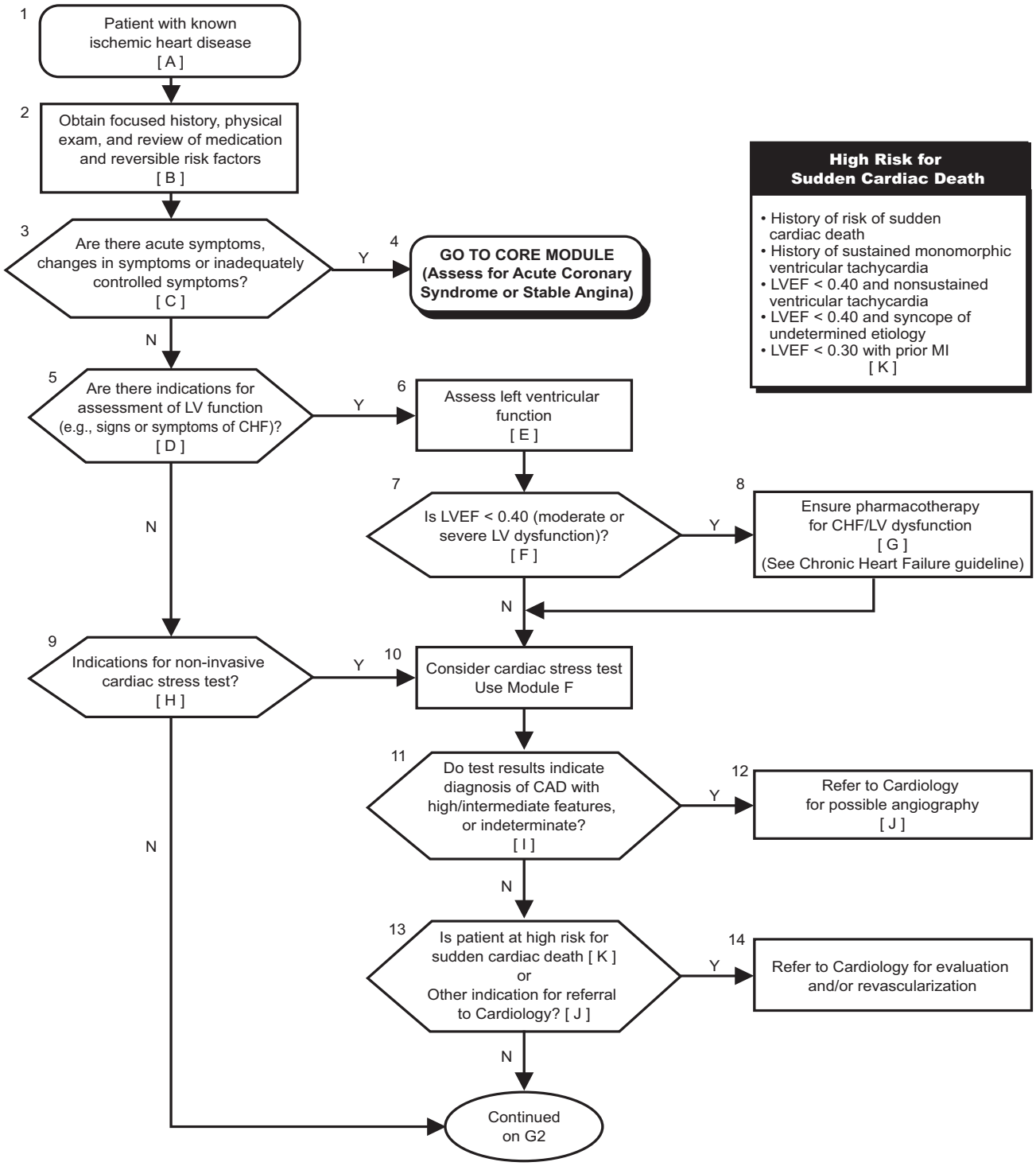
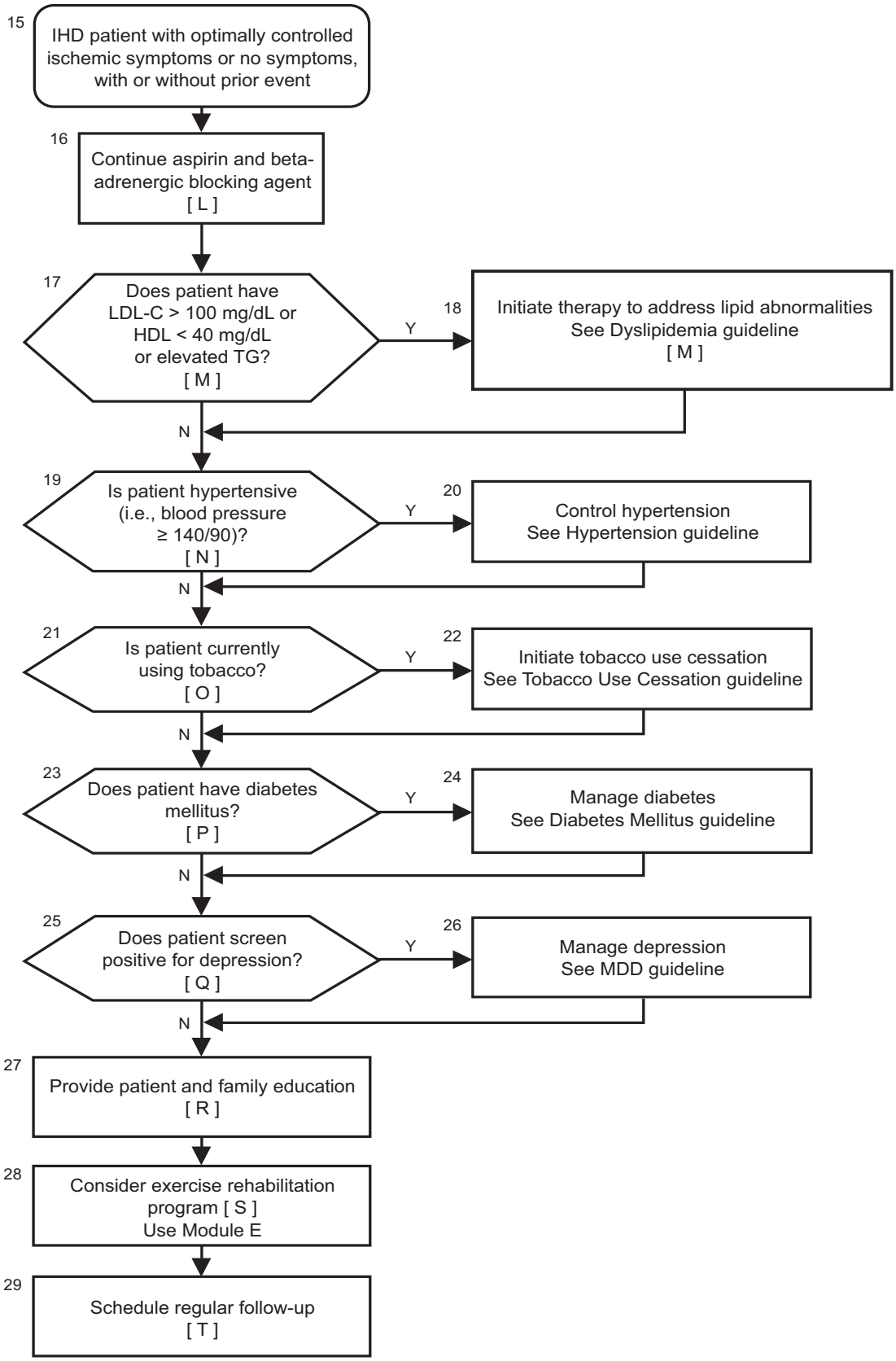
MANAGEMENT OF ISCHEMIC HEART DISEASE
Module G: IHD Follow-Up and Secondary Prevention

G1




15
IHD patient with optimally controlled ischemic symptoms or no symptoms, with or without prior event
16
Continue aspirin and beta-adrenergic blocking agent [L]
17
Does patient have LDL-C > 100 mg/dL or HDL < 40 mg/dL or elevated TG? [M]
Y
18
Initiate therapy to address lipid abnormalities See Dyslipidemia guideline [M]
N
19
Is patient hypertensive (i.e., blood pressure ≥ 140/90)? [N]
Y
20
Control hypertension See Hypertension guideline
N
21
Is patient currently using tobacco? [O]
Y
22
Initiate tobacco use cessation See Tobacco Use Cessation guideline
N
23
Does patient have diabetes mellitus? [P]
Y
24
Manage diabetes See Diabetes Mellitus guideline
N
25
Does patient screen positive for depression? [Q]
Y
26
Manage depression See MDD guideline
N
27
Provide patient and family education [R]
28
Consider exercise rehabilitation program [S] Use Module E
29
Schedule regular follow-up [T]

MEDICAL FOLLOW-UP AND SECONDARY PREVENTION

Candidates for secondary prevention of IHD are patients who have a history of clinical coronary disease.

Generally accepted criteria for a diagnosis of CAD include the following:

- Prior MI and/or pathologic Q-waves on the resting ECG
- Typical stable angina in males older than 50 years or females older than 60 years of age
- Cardiac stress test showing evidence of myocardial ischemia or infarction
- LV segmental wall motion abnormality by angiography or cardiac ultrasound
- Silent ischemia, defined as reversible ST-segment depression by ambulatory ECG monitoring
- Definite evidence of CAD by angiography
- Prior coronary revascularization (percutaneous coronary intervention or coronary artery bypass graft (CABG) surgery)

ASSESS AND DETECT CHANGES IN CLINICAL STATUS

A focused history should include assessment of risk factors for which interventions can improve outcome. Life-extending therapies, such as beta-blockers after MI, aspirin, ACE inhibitors and lipid-lowering therapy, are under-prescribed in patients with known IHD.

Stable patients with IHD may experience sudden or acute changes in their clinical status (e.g., STEMI, NSTEMI, or unstable angina). The diagnosis of acute coronary syndrome (ACS) may be suspected on the basis of a compelling clinical history, specific ECG findings, and/or elevations in serum markers of cardiac necrosis. Patients with symptoms that are new, acute, changed or inadequately controlled should be evaluated according to the CORE Module

Symptoms That May Represent Ischemia or MI

The following may be symptoms of myocardial ischemia. If they are new or are occurring in an accelerating fashion, they should prompt consideration of a possible ACS.

- New onset or worsening chest pain, discomfort, pressure, tightness, or heaviness
  - "New onset" is defined as chest pain or discomfort being evaluated for the first time or the patient with a complaint of chest pain is new to the clinic.
  - "Worsening" is defined as at least a one-class increase (Canadian Cardiovascular Society [CCS] angina classification) in a patient with known previous symptoms attributed to myocardial ischemia.
- Radiating pain to the neck, jaw, arms, shoulders, or upper back
- Unexplained or persistent shortness of breath
- Unexplained epigastric pain
- Unexplained indigestion, nausea, or vomiting
- Unexplained diaphoresis
- Unexplained weakness, dizziness, or loss of consciousness

Patients with evidence of acute changes in symptoms should be evaluated using the core module.

Symptom *Characteristics* That Suggest Noncardiac Pain But Do Not Exclude a Diagnosis of CAD

- Pleuritic pain (i.e., sharp or knife-like pain brought on by respiratory movements or cough)
- Primary or sole location of discomfort in the middle or lower abdominal regions
- Pain that may be localized at the tip of one finger, particularly over costochondral junctions or the LV apex
- Pain reproduced with movement or palpation of the chest wall or arms
- Constant pain that lasts for many hours
- Very brief episodes of pain that last a few seconds or less
- Pain that radiates into the lower extremities

Adequate Control of Symptoms

The level of symptoms that constitute "adequate control" is highly dependent on the following:

- Stage of the CAD
- Whether or not revascularization is feasible at an acceptable risk
- Patient's tolerance or intolerance of anti-anginal drugs
- Patient's preference

Changes in exercise tolerance and symptoms, over time, are particularly useful in assessing the adequacy of control of myocardial ischemia symptoms. The CCS classification of angina is useful for the serial assessment of exercise tolerance and anginal symptoms. Indications for altering therapy and the therapeutic details are presented in Module C, Stable Angina.

Canadian Cardiovascular Society Classification of Angina

Class I	Angina only with *strenuous* exertion
Class II	Angina with *moderate* exertion
Class III	Angina with *minimal* exertion or ordinary activity
Class IV	Angina *at rest* or with *any* physical activity

MAINTENANCE/MEDICAL THERAPY OF CHRONIC IHD

Recommended Medications for Patients with IHD
Aspirin (or clopidogrel) reduces cardiovascular (CV) events in patients with acute MI, previous MI, and unstable angina
Aspirin reduces risk of MI in patients with chronic stable angina
Beta-blockers improve symptoms in patients with IHD
Beta blockers improve CV outcomes in patients with IHD, previous MI and ischemic LV dysfunction
Beta-blockers reduce CV events in patients with silent ischemia
Nitroglycerin (prn)
ACE inhibitors improve CV outcomes in patients with IHD, and are especially recommended in patients with diabetes or low LV ejection fraction
Lipid-lowering therapy improves CV outcomes in patients with IHD and elevated lipids
Lipid-lowering therapy improves CV outcomes in patients with IHD and average cholesterol
Gemfibrozil improves outcomes in patients with IHD and low high-density lipoproteins – cholesterol (HDL-C)

Recommended Medications for Patients with IHD and LV Dysfunction
ACE inhibitors improve morbidity and mortality in patients with CHF or low EF
Asymptomatic patients, but with low EF, experience survival benefit from ACE inhibitors
Doses of ACE inhibitors should be titrated to target or maximum tolerable dose
Beta-blockers should be considered for all patients with NYHA class II or III CHF, and EF<0.40, after stabilization on ACE inhibitors
Addition of spironolactone to ACE inhibitors and diuretics in patients with severe heart failure improves morbidity and mortality
Digoxin use in heart failure (EF<0.45) does not affect mortality, but decreases hospitalization due to heart failure
Diuretics improve symptoms of volume overload

Adjust Angina Management, if Indicated

Ensure the patient is on optimal anti-anginal therapies.

Three classes of drugs are available for the control of symptoms in patients with chronic stable angina: beta-adrenergic blocking agents, calcium channel blocking agents, and nitrates.

Beta-adrenergic blocking agents are generally considered the first drug of choice because of: (1) the documented survival benefit in patients with prior MI, and (2) the survival benefit in patients with hypertension. Beta-blockers also reduce morbidity from stroke and heart failure in patients with hypertension. Beta-adrenergic blocking agents probably achieve their anti-anginal effect primarily through slowing of the heart rate and to a lesser extent from reduction in systolic pressure and contractility. Therefore, a commonly used "rule of thumb" is to titrate the beta-blocker to angina relief or to a resting heart rate of 55 to 60.

Patients with prior MI, treated with adequate doses of beta-blockers, have reduction in recurrent events and mortality. Every effort should be made to use this class of drugs in these patients in particular but also in all patients with documented IHD. Physicians may overrate contraindications to using beta-blockers in post-MI patients (i.e., diabetes, lower EF, depression, and chronic obstructive pulmonary disease (COPD)). In fact, patients with diabetes and lower EF have proven benefits from beta-blockers post-MI and patients with COPD can often tolerate beta-blockers. The association between depression and beta-blockers has been questioned. In general, the decision to avoid beta-blockers, based on theoretical concerns, should be carefully weighed against the overwhelming evidence supporting their use in patients with CAD.

Overviews of multiple randomized trials indicate that beta-adrenergic blocking agents and calcium channel-blocking agents are equally effective in providing angina relief and in enhancing exercise duration to 1 mm ST-segment depression (Figures 9 and 10, ACC/AHA Stable Angina Guidelines, 1999). Therefore, in patients without prior MI or hypertension, a long-acting calcium channel agent would be acceptable. However, there is ongoing controversy about whether the short-acting calcium channel drugs are associated with increased morbidity and mortality.

Sublingual nitroglycerin has been used in the treatment of angina for more than two hundred years. It is still the mainstay therapy for the immediate relief of angina that has been provoked by exertion or emotion. Furthermore, sublingual nitroglycerin, when taken prior to an activity that commonly causes angina (e.g., walking up stairs or up hill) will often prevent the development of symptoms. Several forms of longer acting nitrates (e.g., isosorbide dinitrate, isosorbide mononitrate, and topical nitroglycerin patches) are also commonly used for prophylaxis of angina. However, care must be taken to ensure a nitrate-free interval of 8 to 12 hours out of every 24, to prevent the development of tolerance. Suggest combining NTG with beta-blockers to prevent reflex tachycardia. The use of a nitrate preparation within 24 hours of the use of sildenafil (Viagra) may cause dangerous hypotension.

The following mnemonic may aid in remembering treatment elements that should be considered:

A = Aspirin and anti-anginal therapy

B = Beta-blocker and blood pressure

C = Cigarette smoking and cholesterol

D = Diet and diabetes

E = Education and exercise

NON-INVASIVE RISK EVALUATION

Assess the Risk of Future Cardiac Events

Among patients with known IHD, the risk of future fatal and nonfatal coronary events ranges from no detectable increase compared to individuals without known IHD to >50 percent per year. Knowledge of such risk is essential to planning diagnostic and treatment strategies. The incidence of complications from non-invasive risk stratification in appropriately selected candidates is extremely low. Thus, the main arguments for not performing non-invasive risk stratification include the following:

- Major morbidity limiting functional status (e.g., bed-ridden from multiple strokes)
- Major morbidity limiting life expectancy (e.g., metastatic cancer)
- Patient refusal

Non-invasive risk assessment has two components: (1) assessment of LV function (LVF), and (2) cardiac stress testing to identify patients likely to have ischemic myocardium at risk.

Assessment of LVF (e.g., Signs or Symptoms of CHF)

Left ventricular ejection function (LVEF) less than 0.40 is one of the strongest predictors of both increased mortality and increased morbidity, including CHF and malignant arrhythmias. Pharmacologic therapy and/or revascularization can favorably affect this clinical course.

Accepted criteria for at least one assessment of LVF in patients with known CAD include the following:

- Symptoms of CHF (e.g., orthopnea or paroxysmal nocturnal dyspnea)
- Significant impairment or recent decrement in exercise tolerance, due to dyspnea or fatigue
- Physical signs of CHF (e.g., elevated jugular venous pressure, unexplained pulmonary rales, laterally displaced point of maximal impulse, and S3 gallop)
- Cardiomegaly on chest x-ray
- Prior MI

Repeat assessment is indicated if there has been an unexplained worsening of CHF symptoms or signs or a significant decrement in exercise tolerance, due to fatigue or dyspnea. Routine reassessment of LVF in stable patients is not indicated.

It is also important to recognize that patients with normal or near-normal LVF (EF >0.40) may experience symptoms of heart failure due to diastolic LV dysfunction. Such patients may also experience symptomatic benefit from diuretics, beta-blockers or nitrates. For specific recommendations for the treatment of diastolic heart failure, the provider is referred to the ACC/AHA Task Force on Practice Guidelines, Guidelines for the Evaluation and Management of Heart Failure (2001).

LV systolic function may be assessed by contrast angiography at cardiac catheterization, two-dimensional echocardiogram, and radionuclide ventriculography. An echocardiogram is preferable in evaluation of patients who also have physical findings suggestive of valvular heart disease in order to assess the severity of mitral regurgitation or aortic stenosis along with assessment of LV systolic function.

Of note, Silver et al. (1994) developed a clinical rule to identify patients with prior MI who had LVEF ≥0.40. They found a positive predictive value of 98 percent in those patients who have ALL of the following characteristics:

- Interpretive ECG (without left bundle branch block [LBBB], ventricular pacing, or LV with strain pattern)
- No prior Q-wave MI
- No history of CHF
- Index MI which is not a Q-wave anterior infarction

Cardiac Stress Test

The risk of exercise testing in appropriately selected candidates is extremely low, and thus the main argument for not performing an exercise test is that the extra information provided would not be worth the extra cost of obtaining that information or the test might provide misinformation that could lead to inappropriate testing or therapy.

- Unless cardiac catheterization is indicated, completed or planned symptomatic patients with suspected or known CAD should usually undergo exercise testing to assess the risk of future cardiac events, unless they have confounding features on the rest ECG.
- Patients undergoing only a submaximal exercise stress test (EST) prior to discharge for an acute coronary syndrome (ACS) should receive a symptom-limited EST at 3 to 6 weeks from discharge.

Cardiac stress testing is indicated in the initial evaluation of all patients with known or suspected IHD (with the exceptions noted above), unless there are criteria for proceeding directly to cardiac catheterization and coronary arteriography (see Referral to Cardiology below). Patients with evidence of inducible ischemia during risk stratification should be considered for further cardiac evaluation, such as coronary arteriography. Repeat cardiac stress testing is indicated if there has been a significant change in symptoms or decrement in exercise tolerance; however, routine periodic stress testing is not indicated.

REFERRAL TO CARDIOLOGY

With only a few exceptions, coronary angiography is generally not indicated in asymptomatic or mildly symptomatic patients with either known or suspected CAD, unless non-invasive testing reveals findings that suggest a high risk for adverse outcomes. Also, some patients with extenuating circumstances should *not* be routinely referred to cardiology. These general circumstances include the following:

- Review of prior coronary angiogram by current clinician showing disease not amenable to revascularization by current standards
- Patient refusal of catheterization and/or revascularization and/or patient and physician prefer medical therapy alone, without further evaluation
- Noncardiac disease with projected life expectancy <6 months or quality of life unlikely to be improved by revascularization.

The following indications for referral to a cardiologist apply only to patients with stable IHD, and not to those with a current or recent ACS, in whom different criteria apply.

- Patients with CCS class 3 to 4 symptoms of ischemia or heart failure on medical therapy.
- Patients dissatisfied with symptoms despite maximal medical therapy.
- Patients with recurrent symptoms following recent (<6 months) revascularization.
- Patients at increased risk for sudden cardiac death
- Patients with high-risk findings on non-invasive testing
- Patients with non-invasive test results that are inadequate for management.

Increased Risk for Sudden Cardiac Death:

Patients with increased risk for sudden cardiac death would benefit from evaluation by an electrophysiologist for consideration of an implantable cardiovertor defibrillator device, including:

- History of risk of sudden cardiac death
- History of sustained monomorphic ventricular tachycardia
- Reduced LVF (EF<0.40) and nonsustained ventricular tachycardia
- Reduced LVF (EF<0.40) and syncope of undetermined etiology
- Reduced LVF (EF <0.30) and prior history of MI

Non-Invasive Cardiac Testing:

The following list includes examples of non-invasive test results that indicate high and intermediate risk, for which cardiology referral for coronary angiography should be considered (adapted from ACC/AHA Guidelines for Coronary Angiography: Executive Summary and Recommendations, 1999).

High-Risk Findings:

- Severe resting LV dysfunction (LVEF<0.35)
- High-risk Duke treadmill score (score ≤ -11)
- Severe exercise LV dysfunction (exercise LVEF<0.35)
- Stress-induced large perfusion defect (particularly if anterior)
- Stress-induced moderate-size multiple perfusion defects
- Large, fixed perfusion defect with LV dilatation or increased lung uptake (thallium-201)
- Stress-induced moderate-size perfusion defect with LV dilatation or increased lung uptake (thallium-201)
- Echocardiographic wall motion abnormality (involving >2 segments) developing at low dose of dobutamine (≤ 10 mg/kg/min) or at a low heart rate (<120 bpm)
- Stress echocardiographic evidence of extensive ischemia

Intermediate-Risk Findings:

- Mild/moderate resting left ventricular dysfunction (LVEF = 0.35 to 0.49)
- Intermediate-risk treadmill score (greater than -11 and less than 5)
- Stress-induced moderate perfusion defect without LV dilation or increased lung intake (thallium-201)
- Limited stress echocardiographic ischemia with a wall motion abnormality only at higher doses of dobutamine involving less than or equal to two segments

Consideration for bypass surgery:

Patients with results from coronary angiography that suggest the need for coronary bypass surgery, but which have not been addressed to the satisfaction of the patient or provider. Patients with the following coronary anatomic findings warrant consideration for bypass surgery:

- Significant left main coronary artery stenosis
- Left main equivalent: significant (70 percent) stenosis of proximal left anterior descending coronary artery (LAD) and proximal left circumflex artery
- Three-vessel disease (survival benefit is greater in patients with abnormal LVF; e.g., with an EF <0.50)
- Proximal LAD stenosis with 1- or 2-vessel disease

SECONDARY PREVENTION FOR IHD

Patient with Prior MI

Patients with prior MI, treated with adequate doses of beta-blockers, have reduction in recurrent coronary events and mortality. Every effort should be made to use beta-blockers in patients with MI in particular but also in all patients with documented IHD. Physicians may overrate contraindications to using beta-blockers in post-MI patients (i.e., diabetes, lower EF, depression, and chronic obstructive pulmonary disease [COPD]). In fact, observational data analyses suggest that patients with DM and lower EF may have a survival benefit from beta-blockers post-MI, and patients with COPD can often tolerate beta-blockers. The association between depression and beta-blockers has been questioned. In general, the decision to avoid beta-blockers, based on theoretical concerns, should be carefully weighed against the overwhelming evidence supporting their use in patients with CAD.

LDL-C THRESHOLDS FOR INITIAL DYSLIPIDEMIA TREATMENT IN PATIENTS WITH IHD

	Baseline LDL-C [mg/dL]	
	≥100	≥130
Patient with known IHD	Diet/exercise Consider drug therapy	Diet/exercise Initiate drug therapy

Treatment of Dyslipidemia

- ***Initial Therapy:*** Evidence clearly supports initiation of pharmacotherapy when LDL-C is >130 mg/dL in patients with CHD (Scandinavian Simvastatin Survival Study Group [4S], 1994). For CHD and CHD equivalents (i.e., type 2 DM) and patients with HDL-C >40 mg/dL and LDL-C <130 mg/dL, there is insufficient evidence on which to base a recommendation for pharmacotherapy. Individual clinicians may choose to initiate drug therapy

for LDL-C >100mg/dL for secondary CHD prevention, based on consensus opinion. However, the CARE study, a prospective secondary prevention trial, found no outcomes benefit when high-dose pravastatin was initiated at a baseline LDL-C <125mg/dL (Sacks, 1996).

- ***Choice of Drug:*** Statins are the best studied and show most benefit, in terms of absolute LDL-C reduction and patient outcome. Older trials with niacin and bile acid resins have shown modest reduction in LDL-C (10 to 20 percent) and CHD event rates, with some evidence of small mortality benefit. Fibrates, which have minimal effect on LDL-C, have shown reduced CHD event rates but not mortality (Frick et al., 1987; Rubins et al., 1999). Statin-based outcome trials have included lovastatin, pravastatin, and simvastatin. There is no convincing evidence that one statin is better than another. Choice and starting dose should be dictated by the required LDL-C reduction, as statins differ in their potency. The dose should be adjusted at 6- to 8-week intervals until the LDL-C reduction goal is achieved.
- ***Aggressiveness of LDL-C Reduction:***

  There is no direct evidence from randomized clinical trials (RCTs) that demonstrates a net benefit (in terms of clinically relevant endpoints) of treating to an LDL-C goal of less than 130 mg/dL. Indirect evidence from the 4S Trial (1994) demonstrated that in patients with previous CHD, treated with simvastatin to an average LDL-C of 118 mg/dL, the benefits clearly outweighed the harms. NCEP III recommends lowering LDL-C to <100 mg/dL in the secondary CHD and CHD equivalents (i.e., type 2 DM) prevention setting. Trials are now underway to determine whether even more aggressive treatment produces additional benefit. An angiographic trial in CABG patients showed that patients treated to a target LDL-C <140mg/dL had worse outcomes than those treated more aggressively to a target LDL-C <85mg/dL (Post CABG Trial, 1997). After four years, angiographic progression for the aggressive and moderate groups was 27 percent and 39 percent, respectively. Revascularization was reduced by 29 percent in the lower LDL-C group. Some experts argue that it is the percentage drop in LDL-C, not the absolute LDL-C achieved, that is important in achieving benefit. Treating to New Targets (TNT) is a 5 year RCT currently underway looking at lowering LDL-C to very low target levels in patients with CHD, who are randomizing to atorvastatin 10 mg versus 80 mg/day. The results of the 4S Trial suggest that there may be additional benefits of lowering LDL-C to less than 130 mg/dL. The VA/DoD Working Group for the management of dyslipidemia recommends a treatment goal of <120 mg/dL, while waiting for a more definitive answer.
- ***HDL-C <40 mg/dL with LDL-C <130 mg/dL:***

Large epidemiologic trials have shown that a low HDL-C is associated with an increased risk for cardiovascular events (Gordon, 1989). In the VA-HIT trial (1999), patients with established cardiovascular disease, an HDL-C <40 mg/dL and an LDL-C <140 mg/dL were randomized to treatment with gemfibrozil versus placebo. The mean entry HDL-C of the treatment arm was 32 mg/dL, and the mean entry LDL-C level was 111 mg/dL. After a mean follow-up of 5 years, the gemfibrozil treatment arm saw a 22 percent relative risk reduction in the combined end-point of nonfatal MI or death due to cardiovascular disease, and a 25-percent reduction in stroke (Rubins et al., 1999). Subgroup analysis of VA-HIT strongly suggests that CHD patients with low HDL-C, triglycerides >200 mg/dL, hypertension, or impaired fasting glucose were particularly likely to benefit from gemfibrozil therapy. The study was not powered to detect an overall mortality benefit.

Assessment and Treatment of High Blood Pressure

Hypertension is a risk factor for developing cardiovascular disease, the risk increasing in proportion to the severity of the hypertension, as demonstrated in multiple observational studies. Treatment of hypertension results in reduction in coronary events, even in patients with mild hypertension or in older populations. There is evidence from hypertension trials that both diuretics and beta-blockers reduce coronary events. In patients with hypertension and IHD, beta-blockers are the preferred first-line agents as they provide additional therapeutic benefit – particularly in patients with prior MI and/or angina. See the VA/DoD Clinical Practice Guideline for the Diagnosis and Management of Hypertension in the Primary Care Setting.

Promote Tobacco Use Cessation

Tobacco use is a strong risk factor for IHD. Smoking cessation is associated with significant reduction in acute cardiac syndromes. Evidence supports the effectiveness of several smoking cessation interventions, including physician recommendation, multidisciplinary clinics, and pharmacological interventions. However, in general, the better smoking cessation rates have been achieved with combinations of interventions, as compared with a single intervention alone.

Primary care providers should advise every patient who smokes about the potential adverse medical consequences associated with tobacco use and counsel them to quit. Detailed recommendations can be found in the VA/DoD Clinical Practice Guideline Management of Tobacco Use in Primary Care.

Management of Diabetes Mellitus (DM)

Achieve tight glycemic control to reduce macrovascular events and achieve microvascular benefits. Patients with DM are at increased risk for adverse cardiovascular events, with rates of MI similar to that of patients with known IHD. Microvascular complications, such as retinopathy and nephropathy, are decreased with improving glycemic control. There is conflicting evidence on whether tight glycemic control reduces macrovascular events, such as MI and stroke. Tight control of glucose in both type 1 and type 2 DM is recommended because of potential reduction of macrovascular events and proven microvascular benefits.

Screen for Depression

Identify patients who also have depression and initiate therapy or referral for therapy. Depression is prevalent in patients with IHD and is independently associated with a worse prognosis. There is efficacious treatment available for depression. It is not known whether the treatment of depression improves CV outcomes, though it is known that such treatment improves compliance with efficacious therapies. There are several available tools to screen for depression in the primary care setting. See the VA/DoD Clinical Practice Guideline for the Management of Major Depressive Disorder in Adults for a discussion of depression screening. As an example, the PRIME MD efficiently screens for criteria-based DSM IV diagnosis of depressive disorders.

Exercise Rehabilitation Program

Consider cardiac rehabilitation as secondary prevention. The benefits of a multi-factorial approach to CV risk-factor management, such as found in a cardiac rehabilitation program, include the following:

- Improvement in exercise tolerance and anginal symptoms
- A more favorable blood lipid profile
- Reduced stress and improved psychosocial well-being
- Reduction in cigarette smoking

Nutrition Therapy

Consider Medical Nutrition Therapy (MNT) by a registered dietician or nutrition professional for clinical nutrition assessment and provision of appropriate nutrition therapy. There are other sources for "heart-healthy" diets, including the American Heart Association (see http://www. deliciousdecisions.org).

Regular Follow-Up

Appropriate follow-up of the patient with IHD will vary for the individual patient. Many patients on a stable medical regimen can be followed on a 6- to 12-month basis. Other patients, however, will need more frequent follow-up to encourage risk-factor modification, assess efficacy of medical regimen, and follow appropriate laboratory tests (e.g., lipids, electrolytes, renal function, and drug levels).

Patient Education

High-quality care requires education to encourage and motivate the patient to participate in therapeutic and preventive efforts. Education should be individualized depending on the patient's resources and needs. Patient and family education may include the following:

- Assess the patient's baseline understanding
- Elicit the patient's desire for information
- Use epidemiologic and clinical evidence
- Use ancillary personnel and professional patient educators when appropriate
- Develop a plan with the patient on what to do when symptoms occur
- Involve family members in educational efforts.
- Remind, repeat, and reinforce